

imaged film and adhesive layer are removed, the release liner is exposed, and the pre-mask and pre-space tapes should adhere sufficiently to the release liner to allow transfer of the graphic article into proper registration with the substrate.

If a release liner includes a network of continuous ridges spaced closely together (See 28 in Fig. 1), only a relatively small surface area on the tops of the ridges is available for bonding to a pre-mask, a pre-space, or a splicing tape. The closely spaced ridges also make it more difficult for the tapes to contact and adhere to the relatively flat land areas between the ridges. The pre-mask, pre-space or splicing tapes have specific conformability and adhesion requirements that enable them to perform their protective and transferability functions, and these requirements cannot be easily modified to enhance adhesion to a release liner.

Rather than chemically modify the pre-mask, pre-space or splicing tapes to enhance adhesion to a release liner, the invention seeks to mechanically modify the features on the release liner itself to allow the tapes to more effectively adhere to the liner. The release liners of the invention include structures with geometries that improve the adhesion of tapes to the liner without sacrifice of the application, bonding and visual properties of the final graphic film product.

Referring to Table 1 on page 16 of the application, the nominal sidewall angle is shown to have an impact on the adhesion between the liner and a conventional handling tape. For example, for a ridge spacing of 1270 μ m, as the sidewall angle decreases from 60° to 45°, the adhesion to the handling tape SCPS-53X increases by approximately 10 grams/2 in width of tape. This increase in adhesion occurs despite the fact that the total area at the top of the ridges decreases by 1%. Increases in adhesion to SCPS-53X also occur for a ridge spacing of 508 μ m as the sidewall angle decreases from 53° to 30° and the total area at the top of the ridges stays constant at 5%.

II. Calhoun '765

In paragraph 2 of the Office Action, claims 1, 4-7, 10, 12-13 and 16-18 are rejected under 35 U.S.C. § 103(a) over U.S. Patent No. 5,462,765 (Calhoun '765). This rejection is respectfully traversed for the reasons that follow.

As noted above, the working examples in the present application show an increase in adhesion to certain handling tapes for release liners having a pitch within the range of 500-2500 μm and structures with a sidewall angle of 30-50°. These pitches and structure sidewall angles are selected to provide improved handling tape adhesion while preserving liquid egress and other beneficial properties of the structured release liner.

Calhoun '765 fails to teach or suggest the claimed pitch, and while this reference discloses structures with sidewall angles within the claimed range, it also discloses structures outside the claimed range. Calhoun '765 does not teach or suggest the specific combination of pitch and sidewall angle ranges that provide the improved handling tape adhesion shown in Table 1 of the present application. The Examiner contends that these ranges are an obvious matter of design choice, but no teaching in Calhoun '765 is cited as support for this proposition. In view of the broad range of structural shapes and pitches described in the reference, Calhoun '765 provides no motivation or suggestion for one of ordinary skill in the art to select the presently claimed ranges, and neither recognizes nor appreciates the improved adhesion that these parameters provide. For these reasons, Applicants respectfully submit that the presently claimed subject matter is not obvious under 35 U.S.C. § 103(a) in view of Calhoun '765.

III. Calhoun '930

In paragraph 3 of the Office Action, claims 1, 4-7, 10, 12-13 and 16-18 are rejected under 35 U.S.C. § 103(a) as obvious over U.S. Patent No. 5,897,930 (Calhoun '930). This rejection is respectfully traversed for the reasons that follow.

Again, Calhoun '930 fails to teach or suggest the claimed pitch, and the reference discloses structures with wide ranges of sidewall angles and shapes. Calhoun '930 does not teach or suggest the specific combination of pitch and sidewall angle ranges that provide the

improved handling tape adhesion shown in Table 1 of the present application. Again the Examiner contends that this is an obvious matter of design choice, but what teaching in Calhoun '930 would motivate a skilled artisan to modify the structures in Calhoun '930 to provide the presently claimed structures? Calhoun '930 (like Calhoun '765 discussed above) does not recognize the problem of adhesion between handling tapes and structured release liners. In view of the broad range of structural shapes and pitches described in the reference, Calhoun '930 provides no motivation or suggestion for one of ordinary skill in the art to select the presently claimed ranges, and neither recognizes nor appreciates the improved adhesion that these parameters provide. For these reasons, Applicants respectfully submit that the presently claimed subject matter is not obvious under 35 U.S.C. § 103(a) in view of Calhoun '930.

IV. Abe

In paragraph 4 of the Office Action, claims 1, 4-6, 10, 12-13 and 16-18 are rejected under 35 U.S.C. § 103(a) as obvious over WO 99/35201 (Abe). This rejection is respectfully traversed for the reasons that follow.

The Abe reference again discloses a broad range of structural shapes, but fails to disclose the combination of pitch and sidewall angle that provides improved adhesion to handling tapes. The Examiner points out that Abe's structures may have sidewall angles between 0 and 90°, but Applicants respectfully submit that this without more does not provide a suggestion or a motivation for a skilled artisan to limit the sidewall angle to 30-50°, or to limit pitch to 500-2500 µm. Again, Abe does not recognize the problem of adhesion to structured release liners, and does not suggest the presently claimed solution. For these reasons, Applicants respectfully submit that the presently claimed subject matter is not obvious under 35 U.S.C. § 103(a) over Abe.

V. Request for Personal Interview

Applicants respectfully request that the Examiner contact the undersigned to schedule a personal interview.

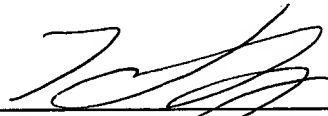
Applicant : Daniel L. Fleming et al.
Serial No. : 09/638,346
Filed : August 15, 2000
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Attorney's Docket No.: 12069-001001 / 55680US002

Enclosed is a \$110.00 check for the Petition for Extension of Time fee. Please apply any other charges or credits to deposit account 06-1050. If questions remain regarding the above, please contact the undersigned.

Respectfully submitted,

Date: November 24, 2003



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